

Basic Linux Tutorial

1



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How to Connect to Linux Server



What is SSH ?


“Secure Shell (SSH) is a [cryptographic network protocol](#) for operating network services securely over an unsecured network.^[1] Typical applications include remote [command-line](#), [login](#), and remote command execution, but any [network service](#) can be secured with SSH.

SSH provides a [secure channel](#) over an unsecured network by using a [client-server](#) architecture, connecting an [SSH client](#) application with an [SSH server](#).” - Wikipedia

How to Connect with Windows



Powershell

 giraycoskun@flow:~

Windows PowerShell

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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

PS C:\Users\GirayCoskun> ssh

```
usage: ssh [-46AaCfGgKkMnNqsTtVvXxYy] [-B bind_interface]
          [-b bind_address] [-c cipher_spec] [-D [bind_address:]port]
          [-E log_file] [-e escape_char] [-F configfile] [-I pkcs11]
          [-i identity_file] [-J [user@]host[:port]] [-L address]
          [-l login_name] [-m mac_spec] [-O ctl_cmd] [-o option] [-p port]
          [-Q query_option] [-R address] [-S ctl_path] [-W host:port]
          [-w local_tun[:remote_tun]] destination [command]
```

PS C:\Users\GirayCoskun> ssh giraycoskun@flow.sabanciuniv.edu

The authenticity of host 'flow.sabanciuniv.edu (10.3.0.30)' can't be established.

ECDSA key fingerprint is SHA256:XH9rK0nmhyBJg6IcnsoZmcfvDm6zZvMueqY2vtjYXVs.

Are you sure you want to continue connecting (yes/no/[fingerprint])? yes

Warning: Permanently added 'flow.sabanciuniv.edu,10.3.0.30' (ECDSA) to the list of known hosts.

giraycoskun@flow.sabanciuniv.edu's password:

Last login: Mon Oct 4 12:57:21 2021 from 10.50.217.105

[giraycoskun@flow ~]\$

Command Prompt

```
giraycoskun@flow:~
Microsoft Windows [Version 10.0.19042.1055]
(c) Microsoft Corporation. All rights reserved.

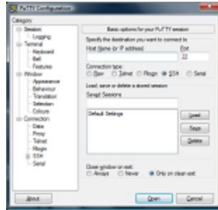
C:\Users\GirayCoskun>ssh
usage: ssh [-46AaCfGgKkMMNnqsTtVvXxYy] [-B bind_interface]
          [-b bind_address] [-c cipher_spec] [-D [bind_address:]port]
          [-E log_file] [-e escape_char] [-F configfile] [-I pkcs11]
          [-i identity_file] [-J [user@]host[:port]] [-L address]
          [-l login_name] [-m mac_spec] [-O ctl_cmd] [-o option] [-p port]
          [-Q query_option] [-R address] [-S ctl_path] [-W host:port]
          [-w local_tun[:remote_tun]] destination [command]

C:\Users\GirayCoskun>ssh giraycoskun@flow.sabanciuniv.edu
giraycoskun@flow.sabanciuniv.edu's password:
Last login: Mon Oct  4 13:00:48 2021 from 10.50.217.105
[giraycoskun@flow ~]$
```

PuTTY - 1

Documentation: <https://the.earth.li/~sgtatham/putty/0.76/html/doc/>

Download link: <https://www.putty.org/>



Download PuTTY

PuTTY is an SSH and telnet client, developed originally by Simon Ta with source code and is developed and supported by a group of volu

You can download PuTTY [here](#).

Below suggestions are independent of the authors of PuTTY. They are *not* i



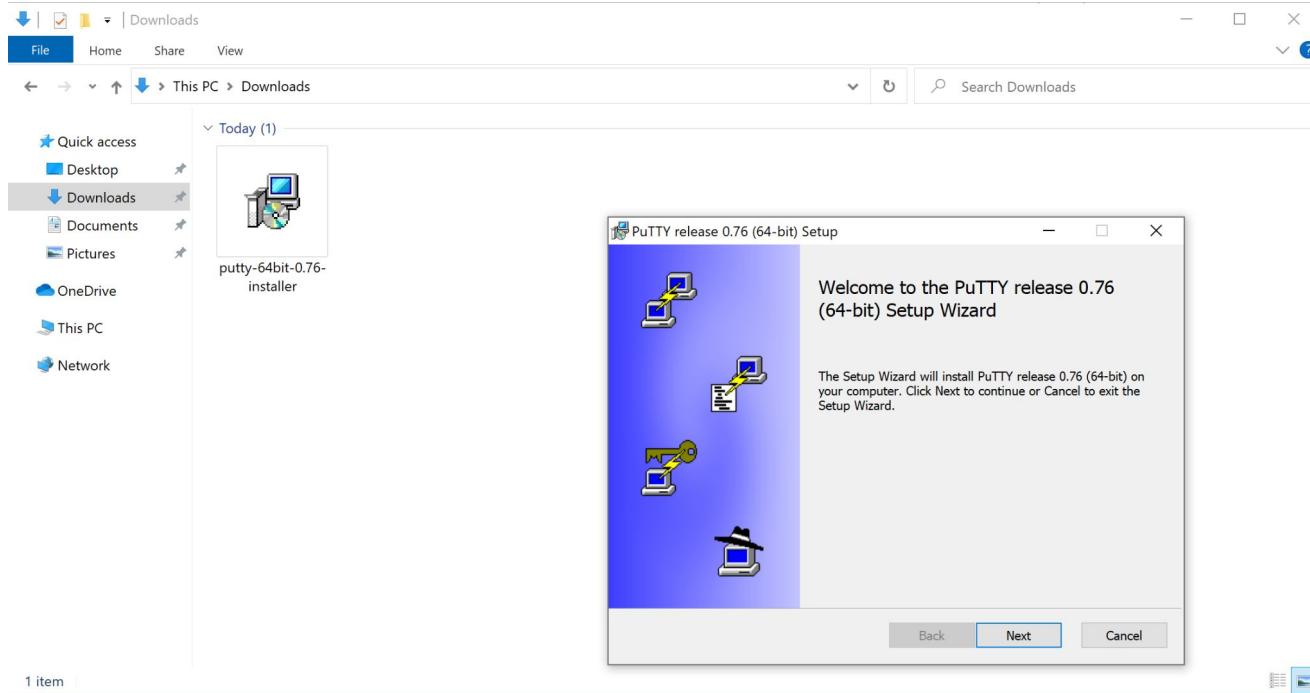
Bitvise SSH Client

Bitvise SSH Client is an SSH and SFTP client for Windows. It is developed and : supports all features supported by PuTTY, as well as the following:


- graphical SFTP file transfer:

PuTTY - 2

- Install by installer app
- Next → Next → Accept



PuTTY - 3

 PuTTY Configuration ? ×

Category:

- [-] Session
 - [-] Logging
- [-] Terminal
 - [-] Keyboard
 - [-] Bell
 - [-] Features
- [-] Window
 - [-] Appearance
 - [-] Behaviour
 - [-] Translation
 - [+] Selection
 - [-] Colours
- [-] Connection
 - [-] Data
 - [-] Proxy
 - [+] SSH
 - [-] Serial
 - [-] Telnet
 - [-] Rlogin
 - [-] SUPDUP

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address) Port

Connection type:

☒ SSH ☐ Serial ☐ Other:

Load, save or delete a stored session

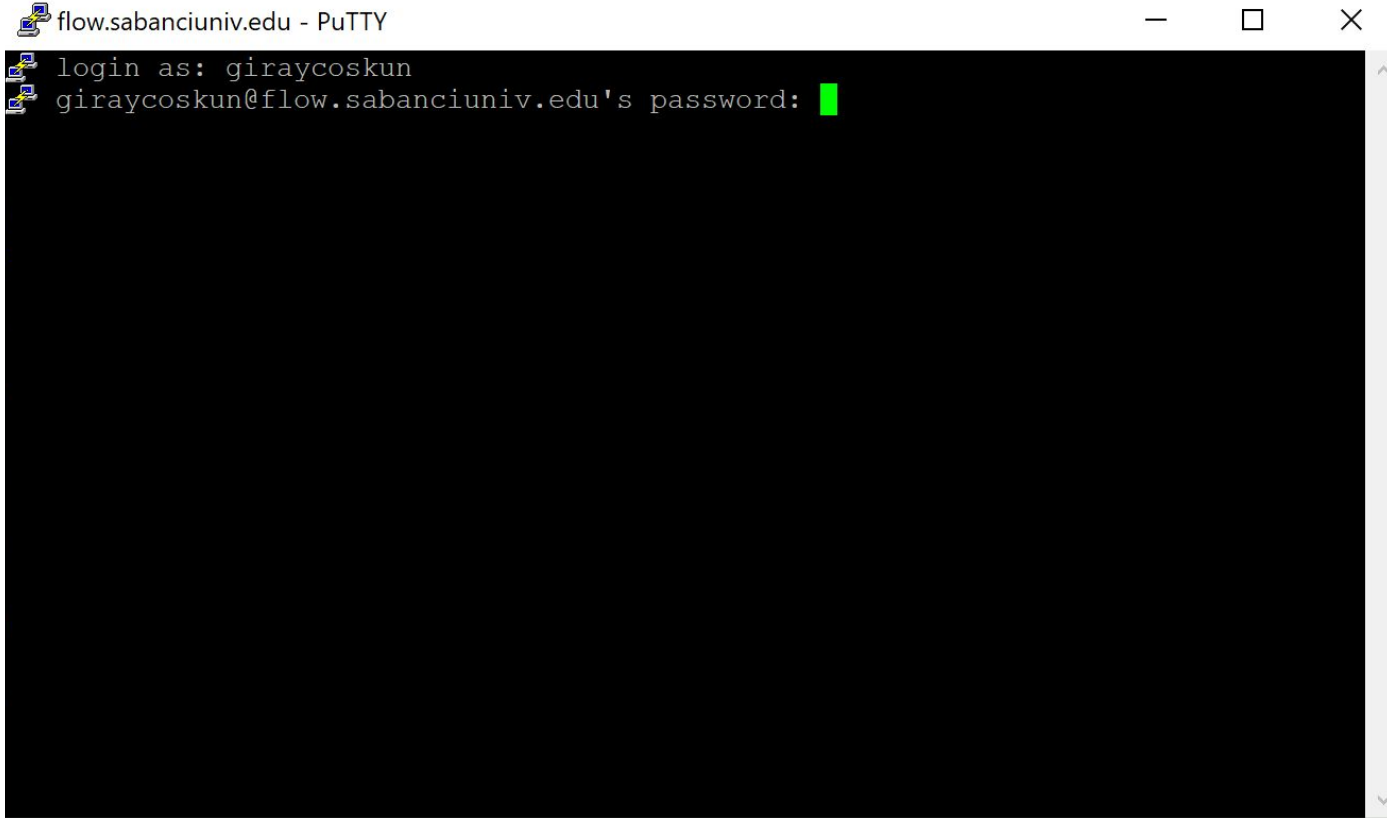
Saved Sessions

Default Settings


Close window on exit:

☐ Always ☐ Never ☒ Only on clean exit

PuTTY - 4



MobaXTerm - 1


 MobaXterm


Home Demo Features **Download** P





Home Edition

Free

- Full **X server** and **SSH** support
- Remote desktop (RDP, VNC, Xdmcp)
- Remote terminal (SSH, telnet, rlogin, Mosh)
- X11-Forwarding
- Automatic SFTP browser
- Master password protection
- Plugins support
- Portable and installer versions
- Full documentation
- Max. **12** sessions
- Max. **2** SSH tunnels
- Max. **4** macros
- Max. **360** seconds for Tftp, Nfs and Cron

 Download now


 MobaXterm


Home Demo Features **Download** Plugins Help Contact    

Customer area Buy

MobaXterm Home Edition

Download MobaXterm Home Edition (current version):

 MobaXterm Home Edition v21.3
(Portable edition)

 MobaXterm Home Edition v21.3
(Installer edition)

Download previous stable version: [MobaXterm Portable v21.2](#) [MobaXterm Installer v21.2](#)

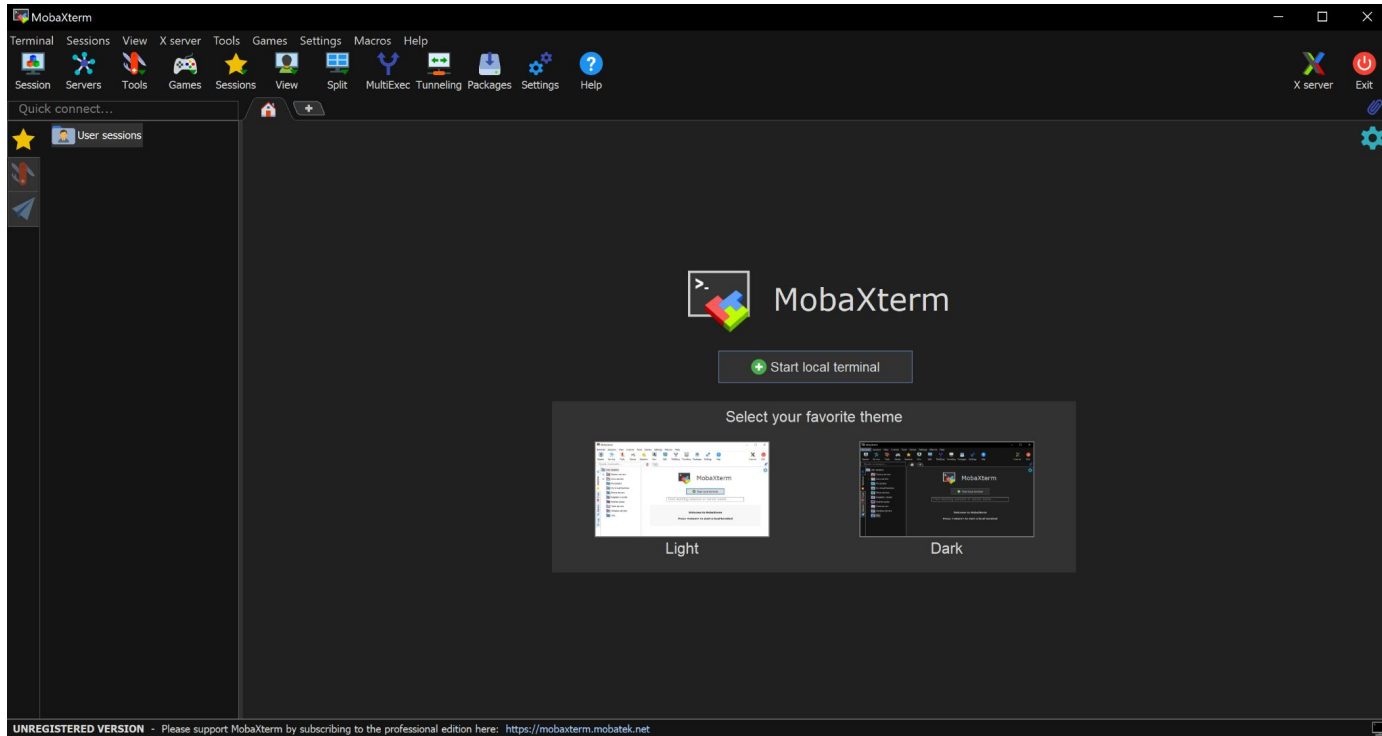
You can also get early access to the latest features and improvements by downloading MobaXterm Preview version:

MobaXterm Preview Version

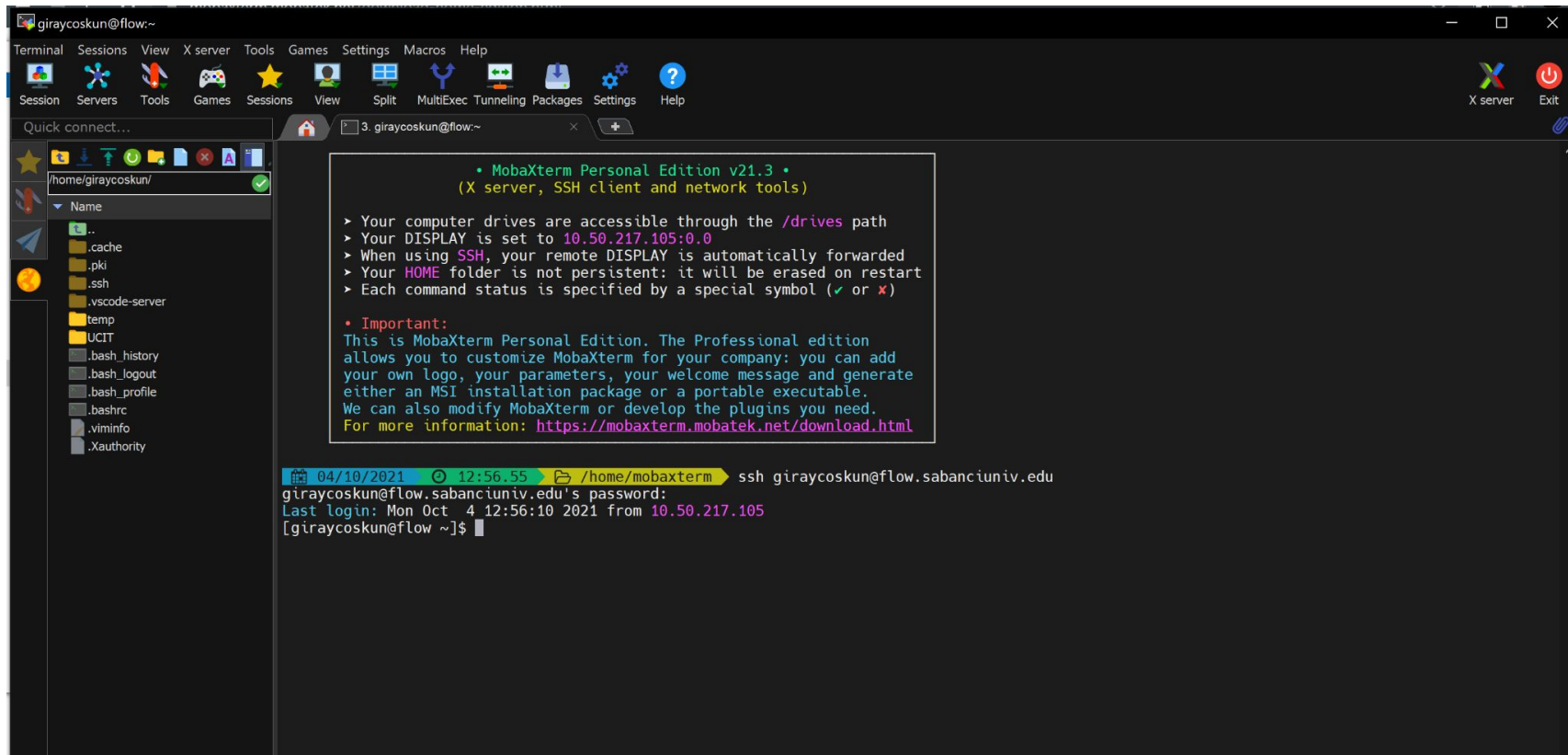
By downloading MobaXterm software, you accept [MobaXterm terms and conditions](#)

You can download the third party plugins and components sources [here](#)

MobaXterm - 2



MobaXterm - 3

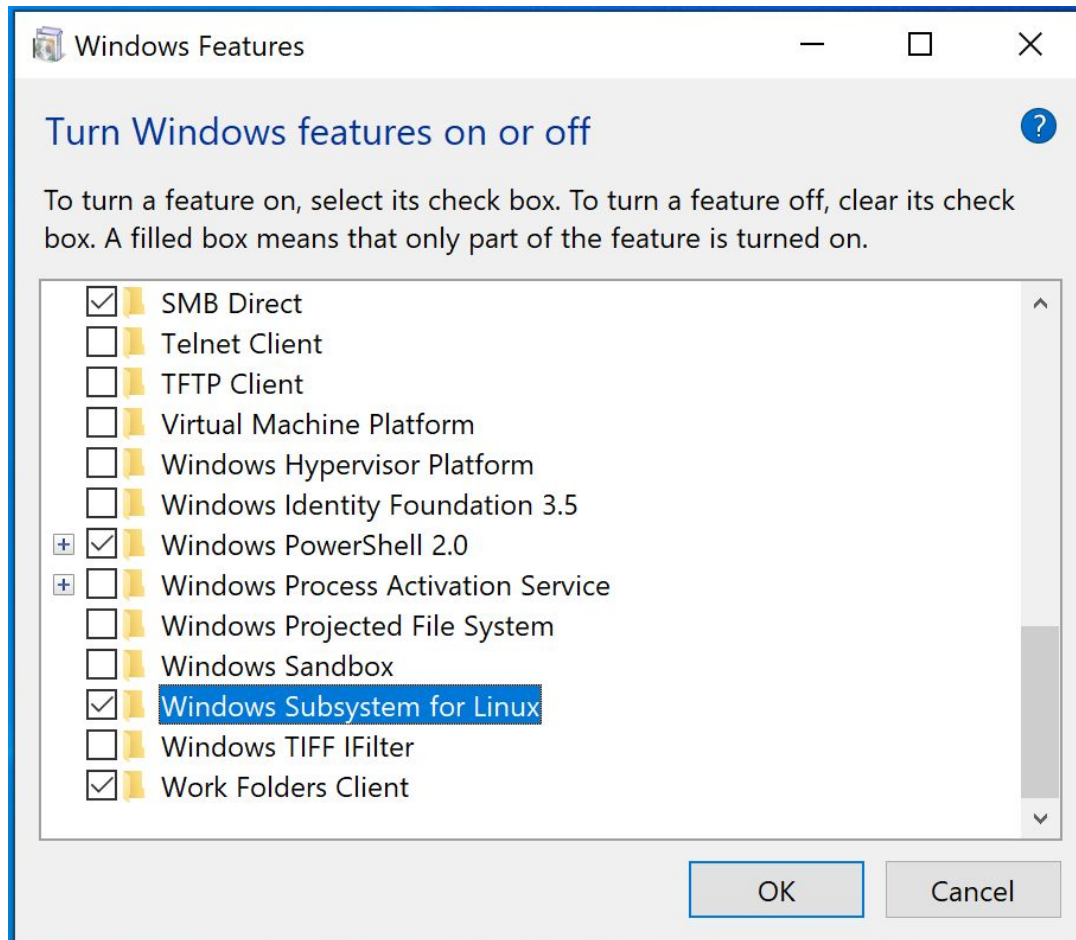


WSL - Windows Subsystem for Linux

- Check your windows version (winver tool)
(<https://docs.microsoft.com/en-us/windows/release-health/release-information>)
- Documentation: <https://docs.microsoft.com/en-us/windows/wsl/install>
- “The Windows Subsystem for Linux lets developers run a GNU/Linux environment -- including most command-line tools, utilities, and applications -- directly on Windows, unmodified, without the overhead of a traditional virtual machine or dualboot setup.” - <https://docs.microsoft.com/en-us/windows/wsl/about>

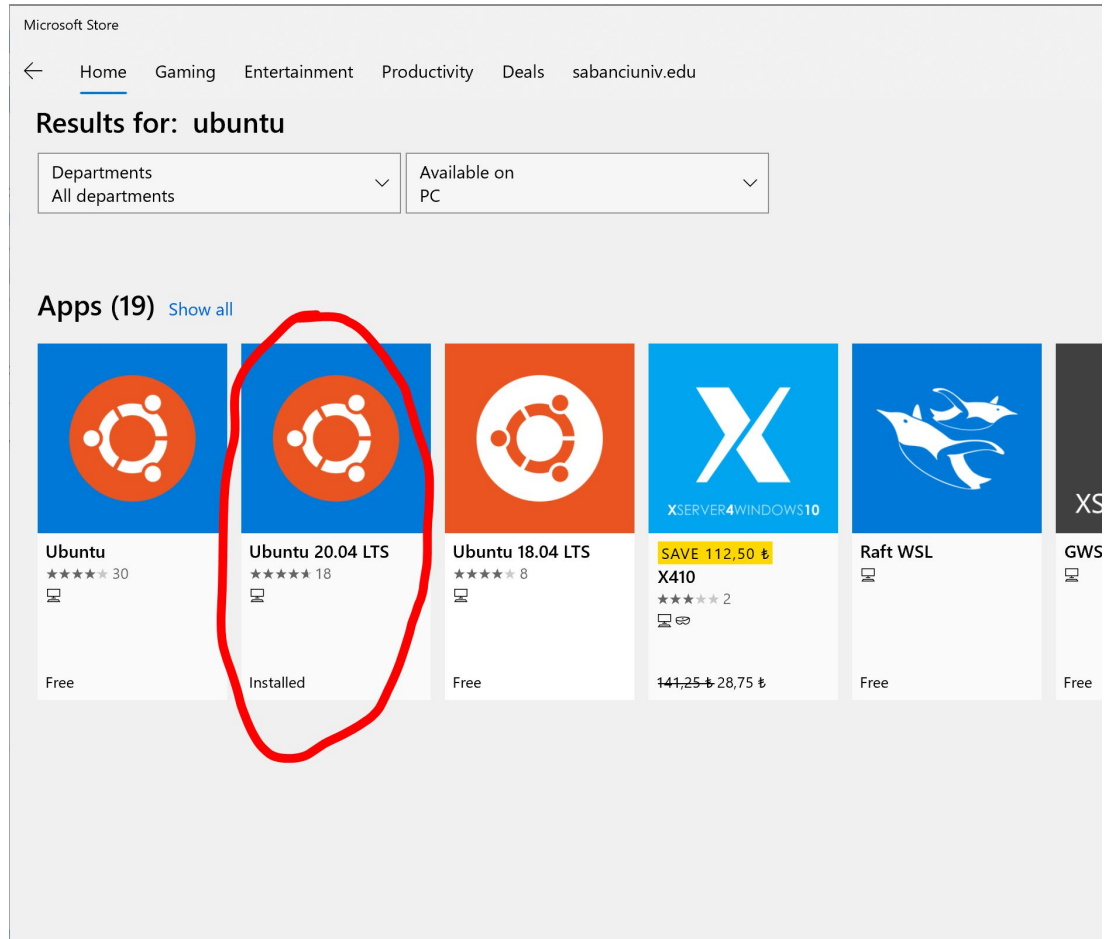
WSL - 1

Needs rebooting !!

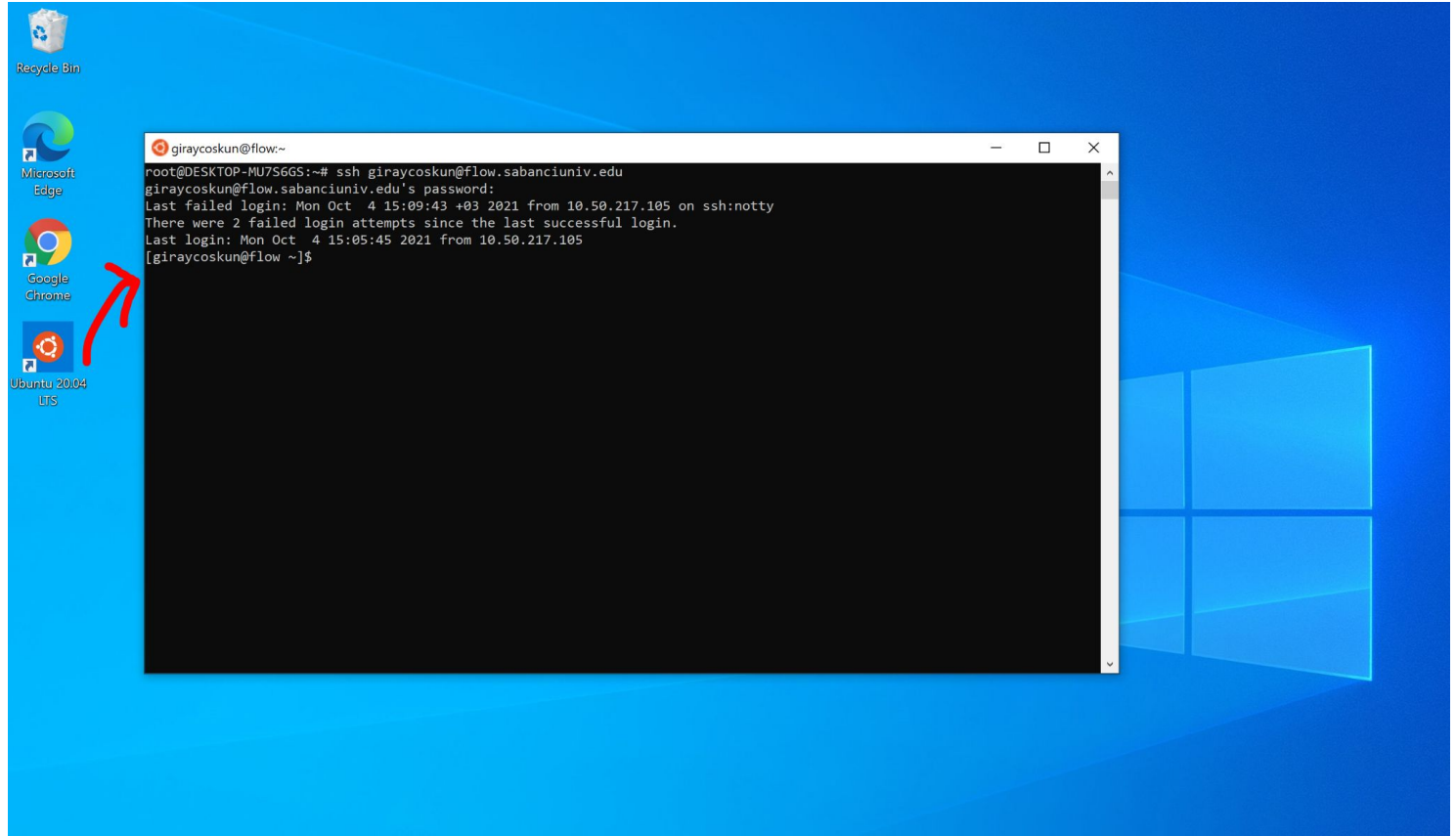


WSL - 2

- You can download any linux distribution from microsoft store however most common one is Ubuntu 20.04



WSL - 3



How to Connect with macOS or Linux



Terminal App

1. Terminal App
2. `ssh <user-name>@<server-name>`
3. user-name = SU username for example “giraycoskun”
4. Server-name = “flow.sabanciuniv.edu”
5. If it is the first time; say yes to the question
6. Enter your password (you won't be able to see the password as you write)

```
gcoskun — giraycoskun@flow:~ — ssh giraycoskun@flow.sabanciuniv.edu — 139x37
Last login: Mon Oct  4 12:04:52 on ttys000
➔ ~ ssh giraycoskun@flow.sabanciuniv.edu
The authenticity of host 'flow.sabanciuniv.edu (10.3.0.30)' can't be established.
ECDSA key fingerprint is SHA256:XH9rK0nmhyBJg6IcnsoZmcfvDm6zZvMueqY2vtjYXVs.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'flow.sabanciuniv.edu,10.3.0.30' (ECDSA) to the list of known hosts.
giraycoskun@flow.sabanciuniv.edu's password:
Last login: Wed Sep 29 16:40:27 2021 from 159.20.93.20
[giraycoskun@flow ~]$
```

Linux Terminal Commands



Commands - 1

- ls → list files
 - touch → create files
 - rm → remove files
 - mkdir → make directories
 - cd → change directory
 - rmdir → remove directory
 - pwd → print working(current) directory
 - cat → print file content to terminal
 - mv → move files
 - cp → copy files
 - chmod → change mod of the files
- (<https://www.computerhope.com/unix/uchmod.htm>)

How to Compile & Run with Linux Commands

- **gcc** command → <https://gcc.gnu.org/>
- gcc hello.c → to compile
- gcc -o <desired_output_filename> <source filename>
*(without -o option, the name of the executable produced is **a.out** by default)*
- gcc hello.c -l<library-name> → to compile with link to a library

Sample Programs

```
#include <stdio.h>

int main(void)

{
    printf("Hello, World!\n");

    return (0);
}
```

```
#include <stdio.h>

#include <math.h>

int main(void)
{
    printf("Hello, Linking Example!\n");

    double example = 14;

    double result = sqrt(example);

    printf ("result = %.1lf\n", result);

    return (0);
}
```


How to copy files from remote to local & local to remote

- **scp** <file-path> <user-name>@flow.sabanciuniv.edu:<location-path>
- scp filename.c giraycoskun@flow.sabanciuniv.edu:/home/giraycoskun/CS305

- **scp** <user-name>@flow.sabanciuniv.edu:<file-path> <location-path>
- scp giraycoskun@flow.sabanciuniv.edu:/home/giraycoskun/CS305/filename.c /Users/giraycoskun/Downloads

Shell Editor Basics

Nano



Add syntax highlighting

- Create **“.nanorc”** file
- Insert the line: **“include /usr/share/nano/c.nanorc”**

Notes:

- ^ → “Ctrl” key OR “esc” twice
- M- → “esc” once

Reference Tutorials

- WSL tutorial:
 - <https://www.youtube.com/watch?v=fntjriRe48>
- Nano Cheat Sheet:
 - <https://www.nano-editor.org/dist/latest/cheatsheet.html>
- Linux Cheat Sheet:
 - <https://www.guru99.com/linux-commands-cheat-sheet.html>
- SCP command:
 - <https://linuxize.com/post/how-to-use-scp-command-to-securely-transfer-files/>